

Satellite Observations of Global Volcanic Unrest

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Abstracts

Dr Ben Esse, University of Manchester:

Volcanoes are conduits connecting the mantle to the Earth's surface and atmosphere, transferring key volatile species (such as carbon dioxide, water, sulphur and halogens) that have, over geological time, enabled the Earth to harbour life. Today, measuring the magnitude and composition of such emissions allow us to peer into the magmatic processes driving volcanic activity, helping us to monitor ongoing unrest, mitigate the hazards posed by eruptions, and understand the impacts of volcanoes on local and global climate. Since the late 1900's, the development of a suite of satellite sensors capable of identifying and quantifying volcanic gas emissions has provided a global view on volcanic degassing, including volcanoes that would otherwise be too remote to monitor from the ground. In this talk we will explore the history of monitoring volcanic gases from space, from the first detections of volcanic sulphur dioxide to modern advances in monitoring passive emissions, as well as looking forward to future advances from upcoming satellite missions.

Dr Iestyn Barr, Manchester Metropolitan University:

Many of the world's active volcanoes are occupied by glaciers and (partly because of these glaciers) eruptions of these volcanoes are often particularly destructive (e.g., because ice melt during eruptions can cause deadly floods). Glaciers on volcanoes are also problematic because they hinder volcano monitoring efforts, both on the ground and via remote sensing. However, since glaciers respond to volcanic unrest through changes in their dimensions and dynamics, it is possible that observing glaciers, particularly with global satellite observations, could help in volcano monitoring efforts. In this talk we explore this possibility by investigating volcanically triggered changes in the dimension and dynamics of glaciers in various regions globally.